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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/306,813	05/07/1999	YOSHINORI KUNO	P99.0372	3991

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EXAMINER	
MISLEH, JUSTIN P	

ART UNIT	PAPER NUMBER
2612	13

DATE MAILED: 12/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/306,813	KUNO ET AL.	
	Examiner	Art Unit	
	Justin P Misleh	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 3* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 - 3* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claim 3** is rejected under 35 U.S.C. 102(b) as being anticipated by Endo et al.

Endo et al. disclose, as shown in figure 2, an interline transfer type CCD image sensor (10) wherein a plurality of image sensing elements (PD) are arranged in an array of rows and columns wherein a plurality of vertical transfer registers (VT) are disposed between each column. Connected to the same one end of the plurality of vertical transfer registers (VT) is a single horizontal transfer register (HT) wherein connected to the end of the single horizontal transfer register (HT) is a floating diffusion output amplifier (OA). In addition, connected to other same one end of the plurality of vertical transfer registers (VT) is a single drain register (SD). According to Endo et al., as stated in column 6 (lines 9 – 30), the CCD image sensor (10) is of a multi-layered type wherein excess charges are swept out by means of the single drain register (SD) during an integration period and then the captured charges are read out by means of the single horizontal transfer register (HT) after the integration period. The CCD image sensor (10) requires eight driving pulses for operation of which six of those driving pulses (bg, V1, V2, V3, V4, and sg) are provided by means of a timing pulse generator (74), as in columns 5 (lines 65 – 68) and 6 (lines 1 – 8). Four of the six driving pulses (V1 – V4, herein referred as CCD

driving pulses), provided by the timing pulse generator (74), are driving pulses for the image sensing elements (PD) and vertical transfer registers (VT). Endo et al. provides a multi-layered CCD image sensor with two distinct modes of operation wherein during a first mode of operation, the timing system includes the timing pulse generator (74) and is arranged as shown in figure 2 and during a second mode of operation the timing system includes the timing pulse generator (152) and is arranged as shown in figure 5. In the first mode of operation (herein referred to as multi-phase mode), the CCD driving pulses (V1 – V4) are four distinctly phased clock pulses and operate in a well-known fashion. In the second mode of operation (herein referred to as single-phase mode), the first two of the CCD driving pulses (V1 and V2) are in-phase clocked pulses and remaining two of the CCD driving pulses (V3 and V4) are held at a predetermined fixed potential (Vc and Vd), as shown in figures 5 and 7. To switch between multi-phase mode and single-phase mode, switching circuits (164 and 166) are provided to switch the remaining two CCD driving pulses (V3 and V4) between in-phase clocked pulses or predetermined fixed potentials (Vc and Vd). If the switching circuits (164 and 166) are not operable, the CCD driving pulses (V1 – V4) operate in multi-phase mode and if the switching circuits (164 and 166) are operable, the CCD driving pulses (V1 – V4) operate in single-phase mode, as described above.

For **claim 3**, Endo et al. disclose, as shown in figures 2 and 5 and as stated in columns 9 and 10, a method for driving a solid state image pickup device provided with a photoelectric converter portion (PD) being composed of a plurality of pixels in a row, and a charge transfer portion (VT) for transferring the charges generated in the row of pixels in the plurality of photoelectric converter portions, wherein in a first mode, driving pulses (V1 – V4) from a pulse generator

(154) are supplied to all charge transfer portions (VT), and in a second mode, driving pulses (V1 – V4) to be supplied to the charge transfer portions (VT) are switched over (by means of switching circuits 164 and 166) to either a predetermined fixed potential (Vc or Vd) or a floating level and wherein the switching over is performed independently from signals of the pulse generator.

As stated above, the switch circuit selection is dependent upon the mode of operation (i.e. multi-phase mode or single-phase mode).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 1 – 3** are rejected under 35 U.S.C. 103(a) as being unpatentable over Endo et al.

Endo et al. disclose, as shown in figure 2, an interline transfer type CCD image sensor (10) wherein a plurality of image sensing elements (PD) are arranged in an array of rows and columns wherein a plurality of vertical transfer registers (VT) are disposed between each column. Connected to the same one end of the plurality of vertical transfer registers (VT) is a single horizontal transfer register (HT) wherein connected to the end of the single horizontal transfer register (HT) is a floating diffusion output amplifier (OA). In addition, connected to other same one end of the plurality of vertical transfer registers (VT) is a single drain register (SD). According to Endo et al., as stated in column 6 (lines 9 – 30), the CCD image sensor (10)

is of a multi-layered type wherein excess charges are swept out by means of the single drain register (SD) during an integration period and then the captured charges are read out by means of the single horizontal transfer register (HT) after the integration period. The CCD image sensor (10) requires eight driving pulses for operation of which six of those driving pulses (bg, V1, V2, V3, V4, and sg) are provided by means of a timing pulse generator (74), as in columns 5 (lines 65 – 68) and 6 (lines 1 – 8). Four of the six driving pulses (V1 – V4, herein referred as CCD driving pulses), provided by the timing pulse generator (74), are driving pulses for the image sensing elements (PD) and vertical transfer registers (VT). Endo et al. provides a multi-layered CCD image sensor with two distinct modes of operation wherein during a first mode of operation, the timing system includes the timing pulse generator (74) and is arranged as shown in figure 2 and during a second mode of operation the timing system includes the timing pulse generator (152) and is arranged as shown in figure 5. In the first mode of operation (herein referred to as multi-phase mode), the CCD driving pulses (V1 – V4) are four distinctly phased clock pulses and operate in a well-known fashion. In the second mode of operation (herein referred to as single-phase mode), the first two of the CCD driving pulses (V1 and V2) are in-phase clocked pulses and remaining two of the CCD driving pulses (V3 and V4) are held at a predetermined fixed potential (Vc and Vd), as shown in figures 5 and 7. To switch between multi-phase mode and single-phase mode, switching circuits (164 and 166) are provided to switch the remaining two CCD driving pulses (V3 and V4) between in-phase clocked pulses or predetermined fixed potentials (Vc and Vd). If the switching circuits (164 and 166) are not operable, the CCD driving pulses (V1 – V4) operate in multi-phase mode and if the switching

circuits (164 and 166) are operable, the CCD driving pulses (V1 – V4) operate in single-phase mode, as described above.

5. For **claim 1**, Endo et al. disclose, as shown in figures 2 and 5 and as stated in columns 9 and 10, a solid state image pickup device (10) being provided with a photoelectric converter portion (PD) having a plurality of pixels disposed in rows and columns, a charge transfer portion (VT) for transferring the charges generated in said photoelectric converter portion (PD) and a charge/voltage converter portion (OA) for converting the charges transferred by said charge transfer portion into voltages comprising: a timing pulse generator portion (154) for generating at least more than one pulse signal (any one of bg, V1, V2, V3, V4, and sg) from among four pulse signals which are; a first pulse signal for driving said charge transfer portion (V1 – V4), a second pulse signal for reading out the charges generated in said photoelectric converter portion (V1 – V4), a third pulse signal for sweeping out the charges generated in said photoelectric converter portion (sg), and a fourth pulse signal for discharging the charges transferred to said charge/voltage converter portion (bg), and a switch circuit (164 and 166) for alternatively selecting between pulse signals of said pulse timing pulse generator (154) or a predetermined fixed potential (Vc or Vd) or a floating level and wherein the switch circuit selection is not dependent upon signals from the timing pulse generator (154).

As stated above, the switch circuit selection is dependent upon the mode of operation (i.e. multi-phase mode or single-phase mode).

Endo et al. do not disclose wherein the plurality of pixels are disposed strictly in a row, rather disposed the plurality of pixels are disposed in an array of rows and columns. At the time invention was made, one with ordinary skill in the art would have been motivated to provide the

plurality of pixels in a row rather than an array simply because all CCD image sensors require thee exact same timing to operate. Therefore, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to have provided the plurality of pixels in a row rather than an array.

6. For **claim 2**, Endo et al. disclose, as shown in figures 2 and 5 and as stated in columns 9 and 10, a method for driving a solid state image pickup device provided with a photoelectric converter portion (PD) having a plurality of pixels disposed in an array of rows and columns, a charge transfer portion (VT) for transferring the charges generated in said photoelectric converter portion and a charge/voltage converter portion (OA) for converting the charges transferred by said charge transfer portion into voltages, wherein: in a first mode, a first pulse signal for driving said charge transfer portion (V1 – V4), a second pulse signal for reading out the charges generated in said photoelectric converter portion (V1 – V4), a third pulse signal for sweeping out the charges generated in said photoelectric converter portion (sg), and a fourth pulse signal for discharging the charges transferred to said charge/voltage converter portion (bg) are selectively supplied to said solid state image pickup device (selectively supplied by means of switching circuits 164 and 166), in a second mode, selectively changing at a at least one pulse signal (V2 or V3) out of the first, the second, the third, and the fourth pulse signals to a predetermined fixed potential (Vc and Vd) or a floating level and wherein the selective changing of at least one pulse signal is performed independently from any of the pulse signals.

As stated above, the switch circuit selection is dependent upon the mode of operation (i.e. multi-phase mode or single-phase mode).

Endo et al. do not disclose wherein the plurality of pixels are disposed strictly in a row, rather disposed the plurality of pixels are disposed in an array of rows and columns. At the time invention was made, one with ordinary skill in the art would have been motivated to provide the plurality of pixels in a row rather than an array simply because all CCD image sensors require thee exact same timing to operate. Therefore, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to have provided the plurality of pixels in a row rather than an array.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin P Misleh whose telephone number is 703.305.8090. The examiner can normally be reached on Monday - Thursday from 7:30 am to 5:30 pm and on alternating Fridays from 7:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy R Garber can be reached on 703.305.4929. The fax phone number for the organization where this application or proceeding is assigned is 703.872.9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is 703.306.0377.

JPM
December 9, 2003

WENDY R. GARBER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600